ASPERGER SYNDROME AND HIGH FUNCTIONING: MOTOR LEARNING AND SCHOOL PERFORMANCE. A CASE STUDY

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Review paper

Abstract
Introduction: Motor behavior is one of the components that determines the quality of school performance in students affected by Asperger Syndrome (AS). Aim: The purpose of this study has been defined in the validating of pedagogical didactic repercussion pursued through a remodeling of the curricular hours, implementing a motor and artistic path. Methods: The research was developed in three school years analyzing the problems related to awkwardness or maldroitness and the difficulty of writing revealed by a subject affected by the Asperger Syndrome attending the secondary School in Naples. Results: The checks coincided with the school term and demonstrated the continuous improvement of the performances of the subject who, at the end of the three years course, managed to control motor behavior, performed written tasks respecting the spaces delimited by margins and lines and has agreed to answer to oral questions with the help of concept maps. Conclusion: The motor proposals oriented to the adequate acquisition of the body and motor scheme as well as the coordination and conditional abilities through training courses related to learning and strengthening coordination, spatio-temporal aspect and movement-control have enabled overcome the considerable motor and relational difficulties of the subject.

Key words: Asperger syndrome, motor control, school, performance, didactic, inclusion.

Introduction

Motor behavior, through the development of motor identity, is one of the components that determines the quality of the academic performance of adolescent subjects by highlighting the correct or defective acquisition of the body schema and basic motor patterns as well as the coordinative (Montesano, 2014) and conditional (Montesano et al., 2013) skills. It is the expression of the motor identity that belongs particularly to the stages of infancy and of the adolescence, which then subsides in adulthood, and which contributes to forming the personal identity. Components such as character, cognitive style, and learning style can undergo changes over the years, just as the personal identity, and the physical one in particular, can be reconfigured not only in the light of changed physical conditions but also as a function of diversification of experiences, of significant events that connot the whole life of human. Physical growth, by monitoring weight (Montesano & Mazzeo, 2019; Mazzeo, 2016b) gain and postural control (Montesano & Mazzeo, 2018) is matched by the affirmation of the identity that is structured progressively according to knowledge. The unequivocal expression of motor identity is movement, which characterizes the animal species and in particular humans, which consist of the translocation of the body in space regulated by the Central Nervous System. Movement is growth: an effective means of acquiring new and different information that leads us to improve our knowledge of ourselves, of the space in which we move, which we intend to occupy, which surrounds us and which we intend to share with others.

Movement can not only be experienced as muscular (Montesano, 2016) development, it is not just training, movement is education, training, regulation, reactivation of our way of life. An active life induces modifications and organic adaptations that make the activity of the organs and of the apparatus of the human body effective, induces modifications and psychic adaptations that make the way of proposing and living more functional both within the intrapersonal and interpersonal relationship. The individual evolution, related to age, then leads to the structuring of the self image (Mead, 1966; Mazzeo & Liccardo, 2019), which is strengthened by an adequate and gratifying motor practice, to the facilitation of interpersonal relationships and to the adaptation of the socialization process with the definition of identity and of that motor in particular. The acquisition of identity comes at the end of a very important conflictual process for the person that is realized in adolescence and youth, periods in which the biological and intellectual development of the subject must confront the social expectations for an adequate demonstration of a functioning adult (Erikson, 1974). The process of identity formation is the most significant phenomenon of existence, an exhilarating but also painful process because the subject who is committed to it must choose a development perspective, synthesized in vital conflictual stages, re - telling others that it feels equally rewarding. In choosing these perspectives, the importance of motor identity emerges, which apparently highlights only the interpersonal aspect but it encompasses all aspects of the individual.
Motility is conditioned by many factors, in fact a distorted self-concept has repercussions on the individual's motive and on the ability to produce and respond to symbols and stimuli; it affects the relationship with others, determining the non-sharing of the group dimension, therefore the inability to assume the attitudes of others, and favoring the phenomenon of exclusion and non-social integration (Di Onofrio et al., 2019).

The construction of the motor identity must therefore be realized respecting the rhythms of growth of each person, in relation to the maturation of the nervous system and motor conduct, in relation to the phases of biological development, psycho-motor and intelligence.

According to the progression of the body immediately, the lived body, the perceived body, the body represented (Le Boulch, 1971; Le Boulch, 1991) which concern the self-awareness through the knowledge and acquisition of the body scheme and the motor patterns. The latter presuppose the acquisition of a body image and an acceptance or at least of a definition of one's body (Schilder, 1973). The construction of the body image first and of the motor identity then fundamentally invests three fields: perceptive, affective and social.

Perceptive for the recognition of sensations and of the position of the body in space and of the possibilities of movement. Affective for the emotional and libidical implications of the subject. Social for the mechanisms that are activated in the presence of a continuous relationship with others.

The difficulty in being aware of and accepting such conditions connotes the disabled person who, more than the able-bodied, shows physical, psychic, functional deficiencies that often make it incapable of expressing potential abilities.

Autism spectrum disorders (ASD) affect around 1.5% of people worldwide. High-functioning autism and Asperger’s Syndrome are both characterized by the presence of normal cognitive functioning, numerous studies have tried to outline the differences between the two conditions (Baron-Cohen, et al., 2001). Symptoms start around age 2, when children fail to maintain eye contact and to develop speech and other forms of communication (Semeraro et al., 2015; Wright, et al, 2020, Costagliola et al., 2009). The reflection on these premises allowed to carry out a research, with a multidisciplinary team coordinated by the author, in a Secondary Education Institute of the city of Naples attended by about 800 students of which 45 affected by various types of disability. The working hypothesis was to observe and detect the behavior and performances of some subjects affected by Autism Spectrum Disorder (Autistic Spectrum Disorders) (Volkmar, Mc Parland, 2014). The initial screening on the disabled population of the Institute allowed to identify eight subjects, of which seven, however, presented some associated pathologies.

The introductory period of observation and detection of the behavior of the recipients of the scientific interest, in the classroom and in the gym, and the comparison with the teachers of the Class Councils, allowed to limit the study planned to an interesting case of Asperger Syndrome. It was followed for about three school years until the end of the training course concluded with the passing of the diploma exam.

Discussion

Case and Syndrome of Asperger

Asperger Syndrome (AS) is a disability that presents compromises in the communicative, cognitive, sensorial, motor and social axes with greater difficulties in the linguistic and cognitive areas (Fontani, 2007). Some authors define Asperger syndrome as a pervasive disorder mental disorder characterized by an inability to understand how to interact socially (Imbimbo, Cornaglia, Costa, 2002). From the third year of life it is possible to diagnose the pathology by verifying the relationship capacity, or the modest capacity in communication. The behavior of the subjects affected by AS is subjective because in some cases they establish good relations, even linguistic ones, with the comrades and the adults while in other cases the relationship is absent or partial as well as the linguistic communication.

The functional characteristics to be taken into consideration concern the maladroitness (Wille, 2003), the modest coordination of movements, the difficulty of relationships, the inability to understand messages, very limited interests, unusual concerns, repetitive actions, lexical and communicative deficiency, for someone, ingenuity, inability to manage changes and absence of common sense (De Meo, Vico, Maschietto, 2000). The playing expressions (sulky face, sad and cheerful look), the good playing ability, the good mental and artistic abilities connote the subjects affected by AS who often show repetitively during a conversation and try to live in a context pre-selected, with special regard to some elements, objects and games. In some cases, the treatments also include drug administration (Mazzeo et al., 2019).

Along three years a 15 years old male subject suffered by AS from the age of 4th and he has been followed for 3 years.

The starting level was detected in two steps in order to identify the potential and then reach the definition of the objectives. The first was developed observing, in a global way, the behavior of the subject in the school activities carried out in class and in the gym. The second one has been analytically investigated by investigating the compromised axes, also deduced from the reading of Functional Diagnosis, starting from topics and situations known by the student to mitigate the state of anxiety and synchronize the relationship between thought, language and action.
The initial survey highlighted, in particular, maldroitess in movement, low self-esteem, difficulty in relationships (Stella, 2004), behavioral stereotypies, excellent amnestic capacity and difficulty in writing with dysgraphic features (Figure 1). Moreover, the school guarantees the administration of drugs during school hours to pupils for whom the health authority prescribes the methods.

Objectives and training path
The aim of the activity was to value the student's real skills with his strengths, to work adequately on critical areas, to develop an apprenticeship path, congruent with the chronological age and the mental age, which also involved the family and social sphere (Janes, 2001).

The achievement of the educational fallout in the school disciplines, related to the performance of the subject, has represented the purpose of stability at the beginning of the training path.

Educational-training interventions have been based on the achievement of objectives aimed at compensating the difficulties related to maldroitess and spatio-temporal organization, logical-deductive reasoning (Valtellina, 2010), abstraction capacity and tolerance to frustrations and stress manifested in hyperactive behavior and relational difficulties of an inhibitory type.

The study was developed for three years, during this period school activities were progressively diversified, which normally provided for attendance for thirty-two hours a week. In the three years the curricular hours have been modulated by increasing the hours of Physical Education and, for the first and second year, of History of Art and of computer writing lab through the reduction of hours of Italian, business economics, mathematics and law.

The planning of activities, integrated into the life project, has been set up favoring the development and strengthening of motor (Bond & Sargent, 1995) and artistic skills, intervening with appropriate initiatives on the control of movements (Hotz, 1996) to develop space-time and orientation skills, along with that of balance (Spera et al., 2019), in order to permit to the subject to accept the normal auxological changes of school and family life.

The boy has accepted the proposal to attend a basic drawing course (comix) in extracurricular time, finding over time that the versatility initially expressed with simple drawings was conveyed in a rewarding creative structured activity (Munari, 2016). At the motor level, activities were proposed which, starting from the sensory domain (Bogdashina, 2011), involved other disciplinary operating areas. For sensorial information, particularly afferent to sight, hearing and touch, we have moved from recognition, inhibition, modulation to the organized elaboration of stimulus.

The transition from motor activity with a playful connotation to that of a true medium of knowledge, learning, exploration of space in relation to one's own body, awareness of one's actions and reactions in order to favor expressive activities and stimulate the creative drive. The programmed frequency of individual and team motor activities has allowed to improve the progressive communication, both verbal and non-verbal, and the acquisition of the concept of space and time. The activities of knowledge and acquisition of the body and motor schema and of the development of coordinative (Magni, 2009) and conditional skills have been developed during the performance of tasks related to computer and traditional writing that, progressively, has been traced back to the margins represented by the notebook lines. The overcoming of the inhibition with regard to the oral exposition, supported by concept maps (Figure 2), represented the litmus test of the effectiveness of the training path, bearing witness to the desired teaching effect.

Materials and methods
The methodological installation (Vitale, 2007) has expected at the entry, the assessment of the skills of the subject AS with motor tests, reading, writing and understanding (Ambel, 2006) of a text, solving problems with simple arithmetic operations. In the first year, the first month (October) was dedicated to the observation of school activities, using appropriate grids, with reference to skills and motor behavior, interests and motivations, verbal and communication skills, organization space-time and the evolution of the graphic sign (Figure. 3) and the drawing.
In the second and third month (November-December) the entry motor tests were administered for the coordinative and conditional (Marella, Risaliti, 2001) abilities, those of writing with both dictation and copying from paper texts and with the help of slides displayed on the PC as well as those of solving simple math problems.

At the end of the first, second and third years the same tests were administered in order to detect improvements in the pupil's academic performance.

At the motor level, the Pilates method was used and the improvements were detected with speed tests (slalom), accuracy of shots on goal (soccer) and of shots for field goal (basketball).

Athlete is prepared to face the tests with an athletic session consisting of an initial general activational, with slow running for about 10 minutes interspersed with one-minute active recovery every five minutes of running, exercises and joint mobilization and stretching, a total preparation time for testing for about twenty minutes.

The first test was detection runner (Table 1) following the path along ten meters and the second test for detecting precision by performing n. 10 (Table 2) shots on goal. The third test was detection of precision by performing n. 10 (see tables) shots on basket (Table 3).

Results

The organized movement has allowed the subject to relate to the environment, as whole and in detail, to develop the sense of orientation with the angular variables, of curve, direction and speed (Di Russo et al., 2010). Game exercises and sports activities have allowed the finalized movement of the body in space, increasing all forms of sensitivity, and enhancing the dynamic body development. Through motor know how, the subject has had the opportunity to improve coordination, endurance, strength, speed and has learned to manage efforts, exertion, avoiding the onset of overtraining syndrome (Montesano et al., 2019). Improvement motor performance, with tests result, was positive for run exercise and shots on goal e negative for shots on basket. The acquisition of awareness has favored the establishment of quiet relationships and improved self-worth by winning the natural reluctance to try out the news and make the transition from the I can not - I can not, I can - I can.

Table 1. Detection times tests of speed.

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<th>Time (second)</th>
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<tr>
<td>Initial</td>
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<td>Final First Year</td>
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<td>Final Third Year</td>
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Table 2. Detection tests of number accurate shots on goal.

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<tr>
<th>Total number of precise shots on goal</th>
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<td>Initial</td>
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<td>Final Third Year</td>
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Table 3. Detection tests of number accurate shots on basket.

<table>
<thead>
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<th>Total number of precise shots on basket</th>
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<td>Initial</td>
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The disciplinary checks coincided with the school term and testified the continuous improvement of the scholastic performance of the subject, with reference to the disciplinary upgrade of the artistic-expressive skills (Figure 3) and relating to writing (Figure 4) and oral exposure.

At the end of the three years the results of the tests showed that the boy was able to control motor behavior, performed written tasks respecting the spaces delimited by margins and staves, validating the objective of spatial coordination, and agreed to confer orally with the help of concept maps.

Conclusion

The examination of the case has showed a revealing improvement in the performances, referred to the academic and motor performance and to the relationship terms, of the AS subject. Autonomy, communication, language (written and oral), motor skills axes have been upgraded and the boy has also shown ability in artistic and writing activities (Figures 3, 4).

The motor path was effective since it allowed the comparison of the passage from the practical to the theoretical and vice versa. The possibility of reporting in a written text a motor experience supported by the awareness of ability has gratified the commitment of the subject who, over the time, has always shown greater interest in the formative proposals until reach the state of continuous demand for daily commitment. The aim of the research, related to the achievement of adequate didactic spin off through the practice of motor activity, has been fully satisfied and this, in perspective, may allow a critical reflection on the validity of the modulation of the teaching hours in relation to the actual needs of students, related problems and educational and training needs.

References


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